[0016] As shown in **FIG. 3***a*, each front side sensor bracket **7** includes an upper end portion **7***a* at an upper end side, a lower end portion **7***b* at a lower end side, and a bending portion **7***c* formed by bending a portion between the upper fastener portion **7***a* and the lower fastener portion **7***b*. The front side sensor bracket **7** is connected to the lower arm **16** via the upper end portion **7***a* and the front portion of the upper rail **6** via the lower end portion **7***b*. Then, a right front load sensor **21** and a left front load sensor **22** are attached to the respective bending portions **7***c* of the front side sensor brackets **7** on right and left side of the seat cushion **9**. The right front load sensor **21** and the left front load sensor **22** each includes an element for detecting deformation such as a strain gauge and electrically detects a bending degree of the bending portion **7***c* bending in response to the load applied to the seat cushion **9**.

[0017] As shown in **FIG. 3***b*, each rear side sensor bracket **8** includes an upper end portion **8***a* at an upper end side, a lower end portion **8***b* at a lower end side, and a bending portion **8***c* formed by bending a portion between the upper fastener portion **8***a* and the lower end portion **8***b*. The rear side sensor bracket **8** is connected to the lower arm **16** via the upper end portion **8***a* and the rear portion of the upper rail **6** via the lower end portion **8***b*. Then, a right rear load sensor **23** and a left rear load sensor **24** are attached to the respective bending portions **8***c* of the rear side sensor brackets **8** on right and left side of the seat cushion **9**. In the same manner as the right front and left front load sensors **21** and **22**, the right rear load sensor **28** and the left rear load sensor **24** each includes an element for detecting deformation such as a strain gauge and electrically detects a bending degree of the bending portion **8***c* bending in response to the load applied to the seat cushion **9**.

[0018] **FIG. 4** is a block diagram showing an electrical structure of an occupant determination device **20** employed in the vehicle seat. The occupant determination device **20** according to the present embodiment includes the aforementioned load sensors **21** to **24**, and a controller **25**.

[0019] The controller **25** includes a central processing unit (hereinafter referred to as CPU) **26**, a sensor signal input circuit **27**, an output circuit **28**. The sensor signal input circuit **27** includes active filters **27***a*, **27***b*, **27***c*, and **27***d* that are associated with the right front load sensor **21**, the left front load sensor **22**, the right rear load sensor **23** and the left rear load sensor **24**, respectively. The load signal from the load sensors **21** to **24** is input to the CPU **26** via the active filters **27***a* to **27***d*. Each of the active filters **27***a* to **27***d* is a known low-pass filter, which is configured, for example, by a combination of a passive element, which includes a capacitor and a resistor, and an active element, which includes an amplifier. The active filters **27***a* to **27***d* only pass low frequency signals and eliminate other signals among those generated by the load sensors **21** to **24**.

[0020] In the CPU **26**, output load values FR and FL are calculated based on the respective load signals from the right front load sensor **21** and the left front load sensor **22** that have passed through the active filters **27***a* and **27***b* respectively. In addition, output load values RR and RL are calculated based on the respective load signals from the right rear load sensor **23** and the left rear load sensor **24** that have passed through the active filters **27***c* and **27***d* respectively. Then, a detection load value Ws is calculated by summing up the output load values FR, FL, RR and RL.

[0021] The CPU **26** executes various calculations based on the pre-stored control programs and initial data and output the calculation result, which is the occupant determination result to the output circuit **28**. The output result is then output to for example, an airbag controller **30** for controlling the airbag device

[0022] A process of the occupant determination according to the present embodiment is explained based on a flowchart in **FIG. 5**. This process is repeatedly performed in interrupts at predetermined time intervals.

[0023] When a routine of the flowchart is entered, the CPU **26** performs an input operation in Step **101**. Specifically, the CPU **26** reads the load signal from the load sensors **21** to **24**, which has been filtered in the sensor signal input circuit **27**. Next, at Step **102**, the CPU **26** calculates the detection load value Ws by summing up the output load values FR, FL, RR, and RL, which are calculated based on the respective load signals from the load sensors **21**, **22**, **23** and **24**, and once stores that calculated detection load value Ws in a memory. Then the CPU **26** proceeds to Step **103**.

[0024] In Step **103**, the CPU **26** determines whether or not the occupant is adult or child. Specifically, the CPU **26** determines the current occupant condition by reading in the occupant determination result, which has been set and memorized in the memory based on the previous routine operation. If the current occupant determination condition is determined to be in child determination condition, the CPU **26** proceeds to Step **104** for determination of the detection load value Ws to be greater than or equal to a predetermined first determination threshold value A. The first determination threshold value A is set to an appropriate value for determining the occupant to be an adult within the range of posture to be surely determined.

[0025] When it is determined that the detection load value Ws equal to or more than the first determination threshold value A at Step **104**, the CPU **26** proceeds to Step **105** and determines whether the detection load value Ws continues to keep such value (equal to or more than the value A) for a predetermined time T1 or not. The predetermined time T1 is the time for delay process to prevent determination condition change due to temporally increase of the detection load value Ws. If the detection load value Ws continues to keep such value (equal to or more than the value A) for the predetermined time T1, the CPU proceeds to Step **106** to change the determination from child to adult occupant. In more detail, the occupant determination is changed from child determination to adult determination and is memorized in the memory and renewed. The CPU then temporarily stops its processing.

[0026] When the detection load value We is less than the first determination threshold value A at Step **104** or when the detection load value Ws does not continue to keep the value (equal to or more than the value A) for the predetermined time T1 at Step **105**, the CPU stops its processing. Accordingly, the occupant determination is kept to the condition determined at the previous routine (child determination).

[0027] On the other hand, when the current occupant condition is determined to be an adult condition at Step **103**, the CPU proceeds to Step **107** to determine whether the detection load value Ws is less than a second determination threshold value B or not. The second determination thresh-